

8<sup>th</sup> August 2016

Ms Belinda Huddy  
EOH Coastal & Environmental Services  
67 African Street  
Grahamstown

Dear Mr King

**RE-MODELLING OF NOISE IMPACT ASSESSMENT – BRANDVALLEY WIND ENERGY PROJECT**

As per our recent correspondence, please find attached the re-modelling report for the Brandvalley Wind Energy Project near Laingsburg in the Western Cape.

This report is to be viewed as an addendum to the main Noise Impact Report that was issued on the 27<sup>th</sup> April 2016 (Version 4 – Report Number 26/7587). The methodologies used to conduct the remodelling, identification of noise sensitive areas and the project description is described in the main report and is not repeated here.

The purpose of this report is to determine if the final project layout will comply with the noise emission limits as described in the previous report. The project parameters have changed as the number of turbines has been reduced to 58 turbines as well other changes. This has necessitated a remodelling of the layout.

## 1. Noise Sensitive Areas (NSA)

The following noise sensitive areas have been used in the remodelling:

Table 1 – Noise Sensitive Areas

Description	East	South	Within Project Boundary	Type
NSA 1	20°30'17.97"	32°57'10.38"	Yes	Farmhouse
NSA 2	20°32'52.95"	32°59'17.08"	Yes	Farmhouse
NSA 3	20°33'46.34"	32°59'14.38"	Yes	Farmhouse
NSA 4	20°32'50.34"	32°57'02.30"	Yes	Farmhouse
NSA 5	20°35'33.01"	33°04'25.20"	Yes	Farmhouse
NSA 6	20°36'03.35"	32°58'22.40"	No	Farmhouse
NSA 7	20°32'05.40"	33°06'21.24"	Yes	Farmhouse
NSA 8	20°28'42.36"	33°05'39.20"	Yes	Farmhouse
NSA 9	20°23'38.49"	33°10'03.50"	No	Farmhouse
NSA 10	20°21'09.92"	33°08'30.25"	No	Farmhouse
NSA 11	20°23'36.36"	33°04'12.19"	No	Farmhouse
NSA 12	20°25'16.19"	33°04'42.76"	Yes	Farmhouse
NSA 13	20°25'12.35"	33°04'05.63"	Yes	Farmhouse
NSA 14	20°27'42.38"	33°02'14.53"	Yes	Farmhouse
NSA 15	20°33'09.67"	32°54'52.62"	No	Farmhouse
NSA 16	20°22'49.18"	33°07'02.68"	No	Farmhouse
NSA 17	20°23'36.67"	33°05'09.53"	No	Farmhouse
NSA 18	20°29'22.71"	33°03'29.96"	Yes	Farmhouse
NSA 19	20°25'51.24"	33°06'16.52"	Yes	Farmhouse
NSA 20	20°28'51.51"	33°10'20.42"	No	Farmhouse
NSA 21	20°25'54.65"	33°10'25.14"	No	Farmhouse
NSA 22	20°21'25.27"	32°57'21.98"	Yes	Farmhouse
NSA 23	20°22'07.76"	32°58'30.41"	Yes	Farmhouse
NSA 24	20°16'15.80"	32°57'29.92"	No	Farmhouse
NSA 25	20°19'48.45"	32°53'44.68"	No	Farmhouse
NSA 26	20°27'23.34"	32°52'42.16"	Yes	Farmhouse
NSA 27	20°28'03.60"	32°49'35.62"	No	Farmhouse
NSA 28	20°26'46.16"	33°00'14.10"	Yes	Farmhouse
NSA 29	20°19'04.31"	33°00'15.87"	No	Farmhouse

## 2. Wind Turbine Generators (WTG)

The wind turbine generators that were modelled are described in Table 2 below.

Table 2 - Proposed Turbine Specifications

Manufacturer	<b>Acciona</b>	<b>Siemens</b>	<b>Vestas</b>	<b>Vestas</b>
Type / Version	<b>AW 132/3000</b>	<b>SWT – 3.3</b>	<b>V117</b>	<b>V126</b>
Rated Power	3.0 MW	3.3 MW	3.3 MW	3.3 MW
Rotor Diameter	132m	130m	117m	126m
Tower	Tubular	Tubular	Tubular	Tubular
Grid Connection	50 Hz	50 Hz	50 Hz	50 Hz
Maximum Sound Power Level	107.1 dB	106 dB	107.0 dB	107.5 db
Hub Height	85m	110m	116.5m	117m

Sound Power Level dB(A) reference to 1pW from WindPro 2.9 Catalogue

The sound power levels at lower and higher wind speeds as stated above were interpolated from the published data. The actual sound power levels may be less than those stated above when type certification of the selected turbine is completed. The levels used in the re-modelling are thus a worst case scenario.

The turbine positions are as follows:

Table 3 – WTG Positions

Turbine Number	East	South
1	20°25'44.80"	33°00'55.96"
2	20°25'33.18"	33°01'04.81"
3	20°25'19.76"	33°01'12.67"
4	20°24'36.79"	33°00'53.24"
5	20°24'24.83"	33°01'01.27"
6	20°24'11.90"	33°01'09.07"
7	20°23'36.20"	33°01'11.10"
8	20°23'37.83"	33°00'58.25"
9	20°23'45.84"	33°00'47.19"
12	20°23'48.09"	32°59'42.93"
13	20°24'00.39"	32°59'35.36"
14	20°24'06.87"	32°59'23.70"

Turbine Number	East	South
15	20°24'24.75"	32°59'41.10"
16	20°24'29.38"	32°59'28.84"
17	20°24'41.91"	32°59'21.53"
18	20°24'53.58"	32°59'11.13"
19	20°25'17.85"	32°59'04.75"
20	20°25'44.10"	32°59'03.38"
24	20°25'19.91"	32°58'21.05"
25	20°24'25.27"	32°58'16.83"
26	20°23'50.46"	32°58'20.63"
28	20°24'33.36"	32°57'59.95"
29	20°24'33.87"	32°57'47.06"
30	20°24'37.57"	32°57'34.58"
31	20°24'35.12"	32°57'21.61"
32	20°24'42.24"	32°57'10.21"
34	20°26'03.30"	32°56'42.76"
35	20°26'17.05"	32°56'23.89"
37	20°26'46.09"	32°56'11.32"
40	20°27'06.33"	32°55'54.69"
41	20°26'43.07"	32°55'44.03"
44	20°24'59.71"	32°55'51.45"
45	20°24'57.50"	32°55'29.36"
46	20°25'23.78"	32°55'32.34"
47	20°32'08.84"	32°57'39.50"
48	20°31'56.28"	32°57'46.89"
49	20°31'44.49"	32°57'55.13"
50	20°30'54.17"	32°58'03.57"
51	20°30'41.46"	32°58'10.73"
52	20°30'20.43"	32°57'48.79"
53	20°29'32.94"	32°57'53.96"
54	20°29'06.71"	32°57'54.28"
55	20°28'54.41"	32°58'01.89"
56	20°28'46.68"	32°58'13.03"
57	20°28'21.77"	32°58'17.34"
58	20°29'27.70"	32°58'08.39"
59	20°29'11.42"	32°58'17.90"
60	20°28'51.75"	32°58'29.64"
61	20°28'39.11"	32°58'36.93"
62	20°28'30.61"	32°58'47.68"
63	20°28'03.51"	32°58'48.60"
64	20°27'50.99"	32°58'55.95"
65	20°27'24.88"	32°59'06.20"
66	20°29'05.61"	32°58'50.45"
67	20°28'36.43"	32°59'06.60"
68	20°28'50.04"	32°59'24.71"
69	20°28'24.32"	32°59'27.91"
70	20°28'24.15"	32°59'49.80"

### 3. Modelling Results

The masking effect of the wind noise will mitigate the impact. The results are based on NO wind noise masking, which in reality does not occur. The maximum noise rating limit as per SANS 10103:2008 is 35dB(A) at night and 45 dB(A) for day/night i.e. 24 hours. The cumulative effect of developing both the Brandvalley and Rietkloof Wind Energy Projects was modelled using the Vestas V117 turbine.

The new turbine layout was modelled in WindPro 2.9 using the above data. The results area as follows:

Table 4 - Modelling Results

Night Limit = 35dB(A)

Receiver	Wind Speed m/s	Vestas V117	Vestas V126	Acciona	Siemens	Brandvalley and Rietkloof Cumulative Impact	
<b>NSA1</b>	3	23.2	24.5	37.2	22.3	23.3	
	4	27.5	28.4	37.0	26.7	27.6	
	5	32.0	32.8	36.8	32.0	32.1	
	6	35.5	36.5	36.6	35.1	35.6	
	7	36.4	37.2	36.4	35.8	36.5	
	8	36.8	37.3	36.0	34.8	36.9	
	9	36.8	37.3	35.9	35.8	36.9	
	10	36.8	37.3	36.2	35.8	36.9	
	11	36.8	37.3	36.5	35.8	36.9	
	12	36.8	37.3	36.8	35.8	36.9	
	<b>NSA 2</b>	3	12.7	14.0	26.9	11.8	18.2
		4	17.0	17.9	26.7	16.2	22.5
5		21.5	22.3	26.5	21.5	27.0	
6		25.0	26.0	26.3	25.9	30.5	
7		25.9	26.7	26.1	25.3	31.4	
8		26.3	26.8	25.7	25.3	31.8	
9		26.3	26.8	25.6	25.3	31.8	
10		26.3	26.8	25.9	25.3	31.8	
11		26.3	26.8	26.2	25.3	31.8	
12		26.3	26.8	26.5	25.3	31.8	
<b>NSA 3</b>		3	8.8	10.1	23.0	7.9	14.1
		4	13.1	14.0	22.8	12.3	18.4
	5	17.6	18.4	22.6	17.6	22.9	
	6	21.1	22.1	22.4	22.8	26.4	

Receiver	Wind Speed m/s	Vestas V117	Vestas V126	Acciona	Siemens	Brandvalley and Rietkloof Cumulative Impact
	7	22.0	22.8	22.2	21.4	27.3
	8	22.4	22.9	21.8	22.3	27.7
	9	22.4	22.9	21.7	21.4	27.7
	10	22.4	22.9	22.0	21.4	27.7
	11	22.4	22.9	22.3	21.4	27.7
	12	22.4	22.9	22.6	21.4	27.7
<b>NSA 4</b>	3	18.4	19.7	32.4	17.5	18.5
	4	22.7	23.6	32.2	21.9	22.8
	5	27.2	28.0	32.0	27.2	27.3
	6	30.7	31.7	31.8	30.4	30.8
	7	31.6	32.4	31.6	31.0	31.7
	8	32.0	32.5	31.2	30.1	32.1
	9	32.0	32.5	31.1	31.0	32.1
	10	32.0	32.5	31.4	31.0	32.1
	11	32.0	32.5	31.7	31.0	32.1
	12	32.0	32.5	32.0	31.0	32.1
<b>NSA 5</b>	3	0.0	0.0	0.0	0.0	8.2
	4	0.0	0.0	0.0	0.0	12.5
	5	0.0	0.0	0.0	0.0	17.0
	6	0.0	0.0	0.0	10.2	20.5
	7	0.0	0.0	0.0	0.0	21.4
	8	0.0	0.0	0.0	10.2	21.8
	9	0.0	0.0	0.0	0.0	21.8
	10	0.0	0.0	0.0	0.0	21.8
	11	0.0	0.0	0.0	0.0	21.8
	12	0.0	0.0	0.0	0.0	21.8
<b>NSA 6</b>	3	0.0	0.0	12.9	0.0	2.6
	4	2.9	3.8	12.7	2.1	6.9
	5	7.4	8.2	12.5	7.4	11.4
	6	10.9	11.9	12.3	16.0	14.9
	7	11.8	12.6	12.1	11.2	15.8
	8	12.2	12.7	11.7	15.6	16.2
	9	12.2	12.7	11.6	11.2	16.2
	10	12.2	12.7	11.9	11.2	16.2
	11	12.2	12.7	12.2	11.2	16.2
	12	12.2	12.7	12.5	11.2	16.2
<b>NSA 7</b>	3	0.0	0.0	0.0	0.0	13.2
	4	0.0	0.0	0.0	0.0	17.5
	5	0.0	0.0	0.0	0.0	22.0
	6	0.0	0.0	0.0	10.5	25.5
	7	0.0	0.0	0.0	0.0	26.4
	8	0.0	0.0	0.0	10.6	26.8
	9	0.0	0.0	0.0	0.0	26.8
	10	0.0	0.0	0.0	0.0	26.8

Receiver	Wind Speed m/s	Vestas V117	Vestas V126	Acciona	Siemens	Brandvalley and Rietkloof Cumulative Impact
	11	0.0	0.0	0.0	0.0	26.8
	12	0.0	0.0	0.0	0.0	26.8
<b>NSA 8</b>	3	0.0	0.0	6.6	0.0	19.3
	4	0.0	0.0	6.4	0.0	23.6
	5	1.1	1.9	6.2	1.1	28.1
	6	4.6	5.6	6.0	14.1	31.6
	7	5.5	6.3	5.8	4.9	32.5
	8	5.9	6.4	5.4	13.9	32.9
	9	5.9	6.4	5.3	4.9	32.9
	10	5.9	6.4	5.6	4.9	32.9
	11	5.9	6.4	5.9	4.9	32.9
	12	5.9	6.4	6.2	4.9	32.9
<b>NSA 9</b>	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	6.8	1.4
	7	0.0	0.0	0.0	0.0	2.3
	8	0.0	0.0	0.0	7.0	2.7
	9	0.0	0.0	0.0	0.0	2.7
	10	0.0	0.0	0.0	0.0	2.7
	11	0.0	0.0	0.0	0.0	2.7
	12	0.0	0.0	0.0	0.0	2.7
<b>NSA 10</b>	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	8.2	0.7
	7	0.0	0.0	0.0	0.0	1.6
	8	0.0	0.0	0.0	8.3	2.0
	9	0.0	0.0	0.0	0.0	2.0
	10	0.0	0.0	0.0	0.0	2.0
	11	0.0	0.0	0.0	0.0	2.0
	12	0.0	0.0	0.0	0.0	2.0
<b>NSA 11</b>	3	3.5	4.8	17.8	2.6	9.2
	4	7.8	8.7	17.6	7.0	13.5
	5	12.3	13.1	17.4	12.3	18.0
	6	15.8	16.8	17.2	19.4	21.5
	7	16.7	17.5	17.0	16.1	22.4
	8	17.1	17.6	16.6	18.9	22.8
	9	17.1	17.6	16.5	16.1	22.8
	10	17.1	17.6	16.8	16.1	22.8
	11	17.1	17.6	17.1	16.1	22.8
	12	17.1	17.6	17.4	16.1	22.8
<b>NSA 12</b>	3	1.0	2.3	15.3	0.1	18.8
	4	5.3	6.2	15.1	4.5	23.1

Receiver	Wind Speed m/s	Vestas V117	Vestas V126	Acciona	Siemens	Brandvalley and Rietkloof Cumulative Impact
	5	9.8	10.6	14.9	9.8	27.6
	6	13.3	14.3	14.7	18.1	31.1
	7	14.2	15.0	14.5	13.6	32.0
	8	14.6	15.1	14.1	17.6	32.4
	9	14.6	15.1	14.0	13.6	32.4
	10	14.6	15.1	14.3	13.6	32.4
	11	14.6	15.1	14.6	13.6	32.4
	12	14.6	15.1	14.9	13.6	32.4
<b>NSA 13</b>	3	4.5	5.8	18.8	3.6	19.3
	4	8.8	9.7	18.6	8.0	23.6
	5	13.3	14.1	18.4	13.3	28.1
	6	16.8	17.8	18.2	20.2	31.6
	7	17.7	18.5	18.0	17.1	32.5
	8	18.1	18.6	17.6	19.7	32.9
	9	18.1	18.6	17.5	17.1	32.9
	10	18.1	18.6	17.8	17.1	32.9
	11	18.1	18.6	18.1	17.1	32.9
	12	18.1	18.6	18.4	17.1	32.9
<b>NSA 14</b>	3	9.8	11.1	24.1	8.9	20.5
	4	14.1	15.0	23.9	13.3	24.8
	5	18.6	19.4	23.7	18.6	29.3
	6	22.1	23.1	23.5	24.2	32.8
	7	23.0	23.8	23.3	22.4	33.7
	8	23.4	23.9	22.9	23.6	34.1
	9	23.4	23.9	22.8	22.4	34.1
	10	23.4	23.9	23.1	22.4	34.1
	11	23.4	23.9	23.4	22.4	34.1
	12	23.4	23.9	23.7	22.4	34.1
<b>NSA 15</b>	3	2.2	3.5	16.5	1.3	2.6
	4	6.5	7.4	16.3	5.7	6.9
	5	11.0	11.8	16.1	11.0	11.4
	6	14.5	15.5	15.9	18.5	14.9
	7	15.4	16.2	15.7	14.8	15.8
	8	15.8	16.3	15.3	18.1	16.2
	9	15.8	16.3	15.2	14.8	16.2
	10	15.8	16.3	15.5	14.8	16.2
	11	15.8	16.3	15.8	14.8	16.2
	12	15.8	16.3	16.1	14.8	16.2
<b>NSA 16</b>	3	0.0	0.0	2.8	0.0	0.0
	4	0.0	0.0	2.6	0.0	3.3
	5	0.0	0.0	2.4	0.0	7.8
	6	0.8	1.8	2.2	11.7	11.3
	7	1.7	2.5	2.0	1.1	12.2
	8	2.1	2.6	1.6	11.6	12.6



Receiver	Wind Speed m/s	Vestas V117	Vestas V126	Acciona	Siemens	Brandvalley and Rietkloof Cumulative Impact
	9	2.1	2.6	1.5	1.1	12.6
	10	2.1	2.6	1.8	1.1	12.6
	11	2.1	2.6	2.1	1.1	12.6
	12	2.1	2.6	2.4	1.1	12.6
<b>NSA 17</b>	3	0.0	0.0	12.6	0.0	7.2
	4	2.6	3.5	12.4	1.8	11.5
	5	7.1	7.9	12.2	7.1	16.0
	6	10.6	11.6	12.0	16.4	19.5
	7	11.5	12.3	11.8	10.9	20.4
	8	11.9	12.4	11.4	16.0	20.8
	9	11.9	12.4	11.3	10.9	20.8
	10	11.9	12.4	11.6	10.9	20.8
	11	11.9	12.4	11.9	10.9	20.8
	12	11.9	12.4	12.2	10.9	20.8
<b>NSA 18</b>	3	0.6	1.9	14.9	0.0	20.7
	4	4.9	5.8	14.7	4.1	25.0
	5	9.4	10.2	14.5	9.4	29.5
	6	12.9	13.9	14.3	18.5	33.0
	7	13.8	14.6	14.1	13.2	33.9
	8	14.2	14.7	13.7	18.0	34.3
	9	14.2	14.7	13.6	13.2	34.3
	10	14.2	14.7	13.9	13.2	34.3
	11	14.2	14.7	14.2	13.2	34.3
	12	14.2	14.7	14.5	13.2	34.3
<b>NSA 19</b>	3	0.0	0.0	7.0	0.0	13.9
	4	0.0	0.0	6.8	0.0	18.2
	5	1.5	2.3	6.6	1.5	22.7
	6	5.0	6.0	6.4	13.9	26.2
	7	5.9	6.7	6.2	5.3	27.1
	8	6.3	6.8	5.8	13.7	27.5
	9	6.3	6.8	5.7	5.3	27.5
	10	6.3	6.8	6.0	5.3	27.5
	11	6.3	6.8	6.3	5.3	27.5
	12	6.3	6.8	6.6	5.3	27.5
<b>NSA 20</b>	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	1.5
	6	0.0	0.0	0.0	6.3	5.0
	7	0.0	0.0	0.0	0.0	5.9
	8	0.0	0.0	0.0	6.5	6.3
	9	0.0	0.0	0.0	0.0	6.3
	10	0.0	0.0	0.0	0.0	6.3
	11	0.0	0.0	0.0	0.0	6.3
	12	0.0	0.0	0.0	0.0	6.3

Receiver	Wind Speed m/s	Vestas V117	Vestas V126	Acciona	Siemens	Brandvalley and Rietkloof Cumulative Impact	
<b>NSA 21</b>	3	0.0	0.0	0.0	0.0	0.0	
	4	0.0	0.0	0.0	0.0	0.0	
	5	0.0	0.0	0.0	0.0	0.0	
	6	0.0	0.0	0.0	6.4	2.6	
	7	0.0	0.0	0.0	0.0	3.5	
	8	0.0	0.0	0.0	6.6	3.9	
	9	0.0	0.0	0.0	0.0	3.9	
	10	0.0	0.0	0.0	0.0	3.9	
	11	0.0	0.0	0.0	0.0	3.9	
	12	0.0	0.0	0.0	0.0	3.9	
	<b>NSA 22</b>	3	9.4	10.7	23.6	8.5	9.4
		4	13.7	14.6	23.4	12.9	13.7
5		18.2	19.0	23.2	18.2	18.2	
6		21.7	22.7	23.0	23.9	21.7	
7		22.6	23.4	22.8	22.0	22.6	
8		23.0	23.5	22.4	23.3	23.0	
9		23.0	23.5	22.3	22.0	23.0	
10		23.0	23.5	22.6	22.0	23.0	
11		23.0	23.5	22.9	22.0	23.0	
12		23.0	23.5	23.2	22.0	23.0	
<b>NSA 23</b>		3	15.0	16.3	29.2	14.2	15.1
		4	19.3	20.2	29.0	18.6	19.4
	5	23.8	24.6	28.8	23.9	23.9	
	6	27.3	28.3	28.6	28.1	27.4	
	7	28.2	29.0	28.4	27.7	28.3	
	8	28.6	29.1	28.0	27.5	28.7	
	9	28.6	29.1	27.9	27.7	28.7	
	10	28.6	29.1	28.2	27.7	28.7	
	11	28.6	29.1	28.5	27.7	28.7	
	12	28.6	29.1	28.8	27.7	28.7	
	<b>NSA 24</b>	3	0.0	0.0	2.0	0.0	0.0
		4	0.0	0.0	1.8	0.0	0.0
5		0.0	0.0	1.6	0.0	0.0	
6		0.0	1.0	1.4	12.0	0.1	
7		0.9	1.7	1.2	0.3	1.0	
8		1.3	1.8	0.8	11.9	1.4	
9		1.3	1.8	0.7	0.3	1.4	
10		1.3	1.8	1.0	0.3	1.4	
11		1.3	1.8	1.3	0.3	1.4	
12		1.3	1.8	1.6	0.3	1.4	
<b>NSA 25</b>		3	0.0	0.0	7.9	0.0	0.0
		4	0.0	0.0	7.7	0.0	0.0
	5	2.4	3.2	7.5	2.4	2.4	
	6	5.9	6.9	7.3	14.3	5.9	

Receiver	Wind Speed m/s	Vestas V117	Vestas V126	Acciona	Siemens	Brandvalley and Rietkloof Cumulative Impact
	7	6.8	7.6	7.1	6.2	6.8
	8	7.2	7.7	6.7	14.0	7.2
	9	7.2	7.7	6.6	6.2	7.2
	10	7.2	7.7	6.9	6.2	7.2
	11	7.2	7.7	7.2	6.2	7.2
	12	7.2	7.7	7.5	6.2	7.2
<b>NSA 26</b>	3	2.8	4.1	17.0	1.9	2.8
	4	7.1	8.0	16.8	6.3	7.1
	5	11.6	12.4	16.6	11.6	11.6
	6	15.1	16.1	16.4	19.2	15.1
	7	16.0	16.8	16.2	15.4	16.0
	8	16.4	16.9	15.8	18.7	16.4
	9	16.4	16.9	15.7	15.4	16.4
	10	16.4	16.9	16.0	15.4	16.4
	11	16.4	16.9	16.3	15.4	16.4
	12	16.4	16.9	16.6	15.4	16.4
<b>NSA 27</b>	3	0.0	0.0	0.8	0.0	0.0
	4	0.0	0.0	0.6	0.0	0.0
	5	0.0	0.0	0.4	0.0	0.0
	6	0.0	0.0	0.2	11.1	0.0
	7	0.0	0.6	0.0	0.0	0.0
	8	0.2	0.7	0.0	11.1	0.2
	9	0.2	0.7	0.0	0.0	0.2
	10	0.2	0.7	0.0	0.0	0.2
	11	0.2	0.7	0.1	0.0	0.2
	12	0.2	0.7	0.4	0.0	0.2
<b>NSA 28</b>	3	19.8	21.1	33.9	18.9	21.3
	4	24.1	25.0	33.7	23.3	25.6
	5	28.6	29.4	33.5	28.6	30.1
	6	32.1	33.1	33.3	32.3	33.6
	7	33.0	33.8	33.1	32.4	34.5
	8	33.4	33.9	32.7	31.7	34.9
	9	33.4	33.9	32.6	32.4	34.9
	10	33.4	33.9	32.9	32.4	34.9
	11	33.4	33.9	33.2	32.4	34.9
	12	33.4	33.9	33.5	32.4	34.9
<b>NSA 29</b>	3	0.1	1.4	14.3	0.0	0.2
	4	4.4	5.3	14.1	3.6	4.5
	5	8.9	9.7	13.9	8.9	9.0
	6	12.4	13.4	13.7	17.7	12.5
	7	13.3	14.1	13.5	12.7	13.4
	8	13.7	14.2	13.1	17.3	13.8
	9	13.7	14.2	13.0	12.7	13.8
	10	13.7	14.2	13.3	12.7	13.8

Receiver	Wind Speed m/s	Vestas V117	Vestas V126	Acciona	Siemens	Brandvalley and Rietkloof Cumulative Impact
	11	13.7	14.2	13.6	12.7	13.8
	12	13.7	14.2	13.9	12.7	13.8

#### 4. Discussion

The results above indicate that the 24 hour 45 dB(A) limit for day/night operations will not be exceeded at any of the noise sensitive areas.

The results above indicate that the 35 dB(A) limit for night operations will be exceeded at NSA 1 from 6m/s wind speed for the Vestas (V117 and V126) and Siemens turbines. The Acciona turbine will exceed the night limit from 3m/s. It is highly likely that the wind noise will provide a masking effect at NSA 1 as the rating limit is only exceeded at 6m/s. The WTG noise emissions are thus unlikely to impact the receptors at NSA 1 (if the Acciona turbine is not used).

The 35 dB(A) night guideline limit will be exceeded at NSA 1 if both the Brandvalley and Rietkloof Wind Energy Farms are developed. It is highly likely that the wind noise will provide a masking effect. The impact at NSA 1 is from the Brandvalley turbines and not the Rietkloof turbines.

It is highly recommended that the current ambient noise levels at the affected NSA's be measured on a long term basis to determine the actual ambient sound under different weather conditions. This information can then be used to determine the masking effect that any wind noise may have.

#### 5. Impact Statement

The overall environmental impact of the changes made to the project scope is rated as low as reflected in Table 5 below. The impact rating methodology was supplied by the client (EOH (Pty) Ltd).

Table 5 – Operational Impact Significance Statement Table

Nature of impact	Temporal Scale	Spatial Scale	Severity of Impact	Risk or Likelihood	Overall Significance
<b>WITHOUT MITIGATION</b>					
Impact of the <b>operational</b> noise on the surrounding environment (Including the cumulative impacts)	Short Term (1)	Local (1)	Slight (1)	Unlikely (1)	<b>Low (4)</b>
<b>WITH MITIGATION</b>					
Impact of the <b>operational</b> noise on the surrounding environment	Short Term (1)	Local (1)	Slight (1)	Probable (1)	<b>Low (4)</b>

Please feel free to contact us should you have any further requirements. Assuring you of our best attention at all times.

Yours sincerely



**Dr BRETT WILLIAMS**